WHAT IS CLAIMED IS:

1. A method of identifying a clean speech signal from a noisy speech signal, the method comprising:

receiving an observation vector representing a segment of a noisy speech signal;

estimating a clean speech value and a noise value based on the observation vector;

using the clean speech value and the noise value to set a gain for a filter; and

applying the observation vector to the filter to produce a filtered clean speech vector representing a segment of a clean speech signal.

2. The method of claim 1 wherein estimating a clean speech value and a noise value comprises using parameters that describe a distribution of noise values.

3. The method of claim 2 further comprising determining the parameters of the distribution of noise values.

4. The method of claim 3 wherein determining the parameters of the distribution of noise values comprises determining the parameters based on multiple segments of the noisy speech signal.

5. The method of claim 3 wherein determining the parameters of the distribution of noise values comprises determining a mean of the distribution of noise values using an iteration.

6. The method of claim 5 wherein determining a mean of the distribution of noise values using an iteration comprises at each iteration updating the mean by adding a value to the value of the mean in a past iteration, the value added to the mean not being computed based on a product formed between a covariance of the noise distribution and a difference between the observation vector and another value.

7. The method of claim 1 wherein setting a gain for a filter comprises defining the gain as a ratio with the denominator of the ratio comprising the sum of the clean speech value and the noise value.

8. The method of claim 7 wherein defining the gain as a ratio further comprises defining a ratio with a numerator that is a function of the clean speech value and the noise value.

9. The method of claim 7 wherein defining the gain as a ratio comprises defining the ratio such that it is guaranteed to be positive if the clean speech value and the noise value are positive.

10. The method of claim 1 wherein the observation vector has been formed without applying a frequency-based transform.

11. The method of claim 1 wherein estimating a clean speech value and a noise value comprises using a parameter that describes the covariance of a residue error.

12. The method of claim 11 further comprising determining the covariance of the residue error without using stereo training data.

13. A computer-readable medium having computer-executable instructions for performing steps comprising:

obtaining an estimate of a clean speech value and an estimate of a noise value derived from a noisy speech signal;

setting a numerator of a filter gain ratio as a function of the clean speech value and the noise value;

setting a denominator of the filter gain ratio as a function of the clean speech value and the noise value;

using the filter gain ratio in a filter that is applied to the noisy speech signal.

14. The computer-readable medium of claim 13 wherein obtaining an estimate of a noise value comprises estimating the noise value based in part on a parameter that describes a noise distribution.

15. The computer-readable medium of claim 14 further comprising determining the parameter that describes the noise distribution.

16. The computer-readable medium of claim 15 wherein determining the parameter that describes the noise distribution comprises using the noisy speech signal to determine the parameter.

17. The computer-readable medium of claim 16 wherein determining the parameter comprises determining a mean iteratively, wherein each iteration utilizes an update equation that is formed by maximizing the joint probability of a sequence of observation vectors and a sequence of mixture component indices.

18. The computer-readable medium of claim 13 wherein obtaining an estimate of a clean speech value and an estimate of a noise value comprises estimating a cepstral clean speech value and a cepstral noise value in a cepstral domain and converting the cepstral clean speech value and the cepstral noise value into the spectral domain to produce a spectral

domain clean speech value and a spectral domain noise value. .

19. The computer-readable medium of claim 18 wherein obtaining an estimate of a clean speech value and an estimate of a noise value further comprises smoothing the spectral domain clean speech value and the spectral domain noise value across frequencies.

20. The computer-readable medium of claim 18 wherein obtaining an estimate of a clean speech value and an estimate of a noise value further comprises smoothing the spectral domain clean speech value and the spectral domain noise value across time.

21. The computer-readable medium of claim 13 wherein obtaining an estimate of the noise value comprises utilizing a parameter that describes a distribution for a residue error.

22. The computer-readable medium of claim 21 further comprising determining the parameter that describes the distribution for the residue error without using clean speech training data.

23. The computer-readable medium of claim 13 wherein setting a numerator comprises setting a numerator such that the numerator is guaranteed to be positive if the clean speech value and the noise value are positive.